

Thoughts on the Meaning of “Asymmetric Threats”

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Preface

This monograph was written in the summer of 2000, while the author was on IPA¹ assignment with the Defense Threat Reduction Agency (DTRA). Thus, it predates the attacks of 11 September 2001 and the subsequent war on terrorism. It appears to the author, however, that events since the summer of 2000 (the 11 September 2001 attacks, insurgent actions in Iraq, etc.) have validated the definitions and list of asymmetric threats given in this monograph. Therefore, it is being reproduced now as a Lincoln Laboratory technical report. A new afterword has been added, relating recent terrorist and insurgent activities to the list of asymmetric threats.

¹ Intergovernmental Procurement Act

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1. INTRODUCTION

It is commonplace these days to state that the United States faces asymmetric threats. The general thought process goes as follows:

1. For over four decades the United States fought a Cold War against the Soviet Union—a roughly comparable superpower.
2. During the Cold War, the United States prepared to meet symmetric military threats.
3. With the end of the Cold War and the demise of the Soviet Union, the United States is the world's only superpower.
4. In the post-Cold-War world, the United States must be prepared to meet asymmetric threats of both a military and non-military nature.

Almost everyone agrees with the four statements enumerated in the first paragraph, but there is very little agreement on what constitutes an "asymmetric threat." I have seen numerous definitions of "asymmetric threat," but most of them do not stand up to historical or logical scrutiny.

For example, some definitions I have seen seem to imply that anything done by a weaker party in an attempt to defeat a stronger party is inherently asymmetric. This definition ignores millennia of symmetric conflicts between unequal contestants. In the American Civil War, for instance, it is clear that the North was the superpower: the South was inferior in population, war materials, and overall wealth. Nevertheless, the war was fought with both sides using essentially equivalent equipment and tactics. It is highly doubtful that any historians would term this an asymmetric conflict. In the United States' current situation, this definition reduces to a vacuous tautology. Since the United States is the sole world superpower, all threats—whether from Russia, China, a militia group in Montana, or a solitary scientist gone mad—would be asymmetric.

Other definitions suggest that asymmetric threats are those that involve not "fighting fair" or taking advantage of critical weak points in a stronger enemy's defenses. These definitions blithely ignore the obvious historical fact that warfare is not conducted and has not been conducted as a "fair" sporting event. The very essence of warfare is to manipulate troops, equipment, timing, and terrain to attain overwhelming superiority (i.e., an unfair advantage) at a critical point. This local superiority can be attained by training troops in superior tactics, by developing improved weapons, by achieving surprise, by occupying the high ground, and by many other well-known techniques in the art of warfare. None of these techniques is inherently asymmetric; the competent commander will take advantage of them whether he is on the "stronger" or "weaker" side.

In the remainder of this monograph, I will attempt to provide a more useful definition of "asymmetric threat." I will begin by offering mathematical explications of symmetry and asymmetry. Based on the mathematical explications I will then give an operational definition of asymmetric threat. This operational definition is rather long, but it will allow us to fairly easily examine a particular

action or postulated action and determine whether or not it constitutes an asymmetric threat. To illustrate the use of the operational definition, I will give some historical examples that satisfy this definition of asymmetric threat and some that come close but do not. I will then list current threats that I consider asymmetric. This list turns out to be remarkably short. Most of the asymmetric threats involve weapons of mass destruction (WMD).

2. THE MATHEMATICS OF SYMMETRY AND ASYMMETRY

Symmetry is a guiding principle in much of mathematics and physics. Something is symmetric if it is invariant under some sort of operation or transformation. By contrast, we can say that something is asymmetric if it changes under the same transformation. There are obviously many different mathematical transformations and many kinds of symmetry and asymmetry. For our purposes as we search for a definition of asymmetric threat, let us choose the transformation of geometric projection.

If we project the image of a triangle from one plane to another plane not perpendicular to the first, we find that we get another triangle. The size and shape of the triangle may change, but the figure will always remain a triangle. Thus, we conclude that the property "triangularity" is symmetric with respect to geometric projection. If, however, we project a circle from one plane to another, we find that, except for the special case in which the second plane is parallel to the first, the circle changes into an ellipse. Thus, the property of "circularity" is asymmetric with respect to geometric projection.

Geometric projection gives us an idea of how to assess the symmetry or asymmetry of a potential threat: we can project the actions of another state, or non-state actor, on the United States, and see if the action remains invariant. In quasi-mathematical terms we can express a threat as

(1) country A would attack the United States by doing X.

If we transform this statement by projecting the enemy's actions on our own, we get

(2) the United States would attack country A by doing X.

Now we have the simple conclusion that statement (1) represents an asymmetric action if statement (2) is false, and it represents a symmetric action if statement (2) is true.

To give a trivial example of how this analysis works for an asymmetric threat, let us take the first statement to be

(1a) country A would attack the United States by disseminating anthrax spores.

The transformed statement is

(2a) the United States would attack Country A by disseminating anthrax spores.

Statement (2a) is obviously false, since the United States has renounced the use of biological weapons. Thus, the threat in (1a) is asymmetric.

Likewise, a trivial example of a symmetric threat is given the statement

(1b) country A would attack the United States' command and control system.

The transformed statement is

(2b) the United States would attack country A's command and control system.

This statement is obviously true based on U.S. doctrine and historical precedent. Thus, in the absence of other information, statement (1b) represents a symmetric threat. Note also in this example that the United States' command and control system may be far superior to that of country A; the United States and country A may choose different weapons and tactics to attack the respective command and control systems; the United States and country A may perceive different gains and risks from attacking the respective command and control systems. But just as the changing size and shape of the projected triangle did not alter the "triangularity," none of these details alters the symmetry of this threat.

3. AN OPERATIONAL DEFINITION OF ASYMMETRIC THREAT

An asymmetric threat must satisfy the following three criteria.

First, it must involve a weapon, tactic, or strategy that a state or non-state enemy both could and would use against the United States. Stating this criterion may seem pedantic, but after all, there needs to be some reality to the threatened action.

Second, it must involve a weapon, tactic, or strategy that the United States would not employ. This criterion is very strong. It does not simply mean that the United States does not currently possess such a weapon, would not use a tactic under present circumstances, or does not believe a strategy is effective. It means that the United States would not employ the weapon, tactic, or strategy, even if we thought it efficacious, under any currently conceivable circumstances. This criterion assures that the threat is asymmetric according to the analysis of the previous section.

A corollary to the second criterion states that *the threat involves a weapon, tactic, or strategy that the United States would not combat by retaliating in kind and, therefore, could not deter by threatening to retaliate in kind.*

Third, it must involve a weapon, tactic, or strategy that, if not countered, could have serious consequences. This criterion assures that the enemy action actually constitutes a threat.

A corollary to the third criterion states that *the threat involves a weapon, tactic, or strategy that is not already countered by systems designed to deal with symmetric threats.*

4. SOME HISTORICAL EXAMPLES

It is, perhaps, fashionable to think of asymmetric threats as new phenomena, and it is probably true that we have gone from a period of more symmetric threats to one of more asymmetric threats. Nevertheless, throughout history there have been many instances of asymmetric threats. Recounting some historical examples of asymmetric and near-asymmetric threats is useful to understanding our current situation.

Japanese behavior during World War II offers perhaps the most fruitful grounds for examining asymmetric threats. Japan began the war with an asymmetric action—the sneak attack on Pearl Harbor while peace negotiations were actively underway. It is hard to believe that the United States would have launched a similar attack, and although the strategy embodied by the attack failed, the attack was certainly a military victory at the time. Although the United States has been intentionally ambiguous in regard to the possibility of our launching a nuclear first strike, such attacks do not really go along with our national psyche; thus, out-of-the-blue attacks still represent an asymmetric threat.

The classic asymmetric threat was undoubtedly the Japanese use of kamikaze attacks. These attacks combined elements of asymmetric equipment, tactics, and strategy. Kamikaze tactics were effective: suicide planes hit approximately 400 American ships off Okinawa. Some of the success was the result of the crude equipment to which the Japanese resorted. For instance, the destroyer *Callaghan* was sunk by several wood-and-fabric biplanes. These antiquated planes were effective because they were hard to pick up on radar and because the high-technology proximity fuses, which were deadly against the symmetric aircraft threat, did not work well against the small wooden planes. Strategically, the kamikaze threat was also important: until the atomic bombs ended the war, the asymmetric kamikaze threat was a major consideration in American planning for the invasion of the Japanese mainland.

A related Japanese tactic/strategy was that of fighting to the death. Although such actions are not unknown to Americans in isolated engagements, as a general directive of combat it is certainly an asymmetric action. Fighting to the death on Iwo Jima and Okinawa increased casualties (on both sides) to an extent that horrified American war planners contemplating invasion of the Japanese mainland. Whether in the absence of the atomic bomb this asymmetric strategy would have benefited Japan is an open question. It does seem plausible that a similar strategy, counting on the American aversion to casualties, could represent a viable asymmetric threat today.

The buccaneers of the 17th and 18th centuries provide examples of asymmetric threats that are relevant today. Pirates such as Henry Morgan used particularly brutal tactics in their operations in the West Indies and along the Spanish Main. Their reputation for brutality helped Morgan and other pirates to win victories over nominally superior foes. Despite (or perhaps because of) his brutality, Morgan was commissioned as a privateer by the British Government, knighted for his

accomplishments, and made lieutenant governor of Jamaica. The analogy to present-day state-supported terrorists is obvious.

Asymmetric actions by the Soviet Union during the Cold War demonstrate that not all asymmetric threats come from distinctly inferior powers. In 1972, the Soviet Union signed the Biological and Toxin Weapon Convention (BWC) banning the use of biological weapons. The following year, however, the Soviet Union created Biopreparat and began a massive expansion of its offensive biological-warfare program. The strategy of negotiating and then ignoring arms-control treaties is obviously an asymmetric threat of some concern today.

It may not be quite historical, but I cannot resist including the doomsday weapon in the movie "Dr. Strangelove" as an example of an asymmetric threat. It certainly had significant consequences and, despite George C. Scott's comment, "I wish we had one of those," developing such a weapon does not seem in the American character.

Besides giving historical examples of actions that satisfied the operational definition of asymmetric threat it is probably useful to give some contrasting examples of asymmetric actions that did not satisfy the full definition. Returning to the Japanese in World War II, I observe that they used asymmetric tactics in their inhumane treatment of prisoners. It does not appear that this tactic constituted an asymmetric threat, however, as it does not seem to have contributed in any positive way to the Japanese war effort.

As another example, the Children's Crusade, led in 1212 by Stephen of Cloyes, was most certainly an asymmetric action. It is impossible to believe that the Muslims holding the Holy Land would have gotten together a children's army to oppose Cloyes' crusaders. But the Children's Crusade was completely inconsequential to the Muslims and, thus, was not an asymmetric threat.

As a final example, consider the Polish cavalry fighting against the German Panzer troops in 1939. The Polish cavalry was well trained, fought bravely, and may well have been a serious threat to other cavalry or even dismounted troops. But the German Panzers, prepared to meet a symmetric threat of other tanks and mechanized units, were easily able to deal with the Polish cavalry. Thus, the Polish cavalry, although different from the symmetric threat, was not an asymmetric threat.

5. CURRENT ASYMMETRIC THREATS

The following is a list of what I would consider asymmetric threats today. I have grouped them in three categories according to whether the asymmetry comes principally from equipment, tactics, or strategy.

Equipment Asymmetric Threats

1. Use of biological weapons (BW's).
2. Use of chemical weapons (CW's).
3. Use of lasers for blinding.
4. Use of some types of mines.

Treaties proscribe all these activities. I take it as an article of faith that the United States will not develop and employ weapons in contravention to treaties we have signed and ratified.

Tactical Asymmetric Threats

5. Suicide attacks.
6. Surprise first strikes.

As discussed above the Japanese used these asymmetric tactics in World War II. These tactics remain feasible today.

7. Particularly brutal attacks.
8. Indiscriminant attacks on civilians and neutral countries.

These asymmetric tactics have been practiced by pirates and many others throughout history. Modern weapons and sensibilities have, however, expanded the scope of such tactics. For instance, a rogue state in conflict with the United States might threaten to attack a completely neutral target (e.g., Mexico City) with biological weapons. Such an asymmetric threat would, I believe, have to be taken seriously by the United States.

9. Environmental attacks.

Environmental attack is probably a fairly new asymmetric threat. Iraq's setting fire to oilfields is, perhaps, an example of a minor attack. The use of biological weapons to kill off forests or the use of chemicals to pollute major lakes are examples of major asymmetric threats of this type.

10. Attacks on *all* satellite systems (including the attacker's).
11. Attacks on *all* computer systems (including the attacker's).

With respect to 10 and 11, note that selective attacks on satellite systems and computers are part of standard military doctrine to attack C4ISR systems. A country that is far inferior to the United States in such systems, however, may believe that it is beneficial to eliminate all such systems, including its own. Thus, a high-altitude nuclear burst to affect all satellites or a computer virus to attack all computers worldwide would be an asymmetric threat.

Strategic Asymmetric Threats

12. Funding terrorist groups to launch attacks.

Despite some examples of United States funding for "freedom fighters," I think this one is obvious.

13. Fighting not to win but to lose.

This strategy is the one made famous in "The Mouse That Roared." Although the rationale in that movie is unlikely to apply, there may well be scenarios in which a country enters into conflict with the United States in full knowledge that it cannot prevail on the battlefield but with the idea that by losing it can damage the United States' reputation, alliances, or economic agreements.

14. Intentionally exposing one's own population to high casualties.

15. Actually attacking one's own population.

These two strategies have a number of variants, most involving nuclear, biological, or chemical weapons. The "Dr. Strangelove" doomsday weapon discussed above falls in these categories, as do other drastic actions a country might take in its death throes. For instance, a country near defeat might launch widespread BW attacks on its own territory in full knowledge that it would kill many of its own people along with the attackers. It is conceivable that a desperate country would attack its own people with a BW or CW in order to blame the United States for the attack. A country may produce and store biological weapons in heavily populated areas to prevent the United States from attacking the BW facilities or to blame the United States for a BW attack if biological agents were released during an attack on a BW facility.

16. Fighting to the death.

As mentioned above the Japanese pursued this strategy in World War II. Given the American aversion to casualties, some countries may regard it as an effective asymmetric strategy today.

17. Negotiating arms-control treaties with the intent to covertly develop arms in contravention of the treaty.

The Soviet Union pursued this strategy with respect to biological weapons. This asymmetric strategy remains a major concern with regard to weapons of mass destruction.

5. CONCLUDING REMARKS

Applying a reasonable, mathematically based definition of "asymmetric threat" has left us with a remarkably short list of current asymmetric threats—only 17. Even counting 17 may be somewhat exaggerated, since some of the tactics and strategies really depend on using the weapons of mass destruction in the equipment category.

Having defined *asymmetric threat* and listed current asymmetric threats according to the definition, it is appropriate to ask, "Do the definition and list help us in reducing threats?" I think they do, although they only begin to point the way. It is clear that simply listing asymmetric threats does not tell us how to combat them, but it is pellucid that if we cannot even define what asymmetric threats are, we can never reduce these threats.

Afterword

I originally wrote this monograph in the summer of 2000. Since that time there have been numerous actions by states and terrorist organizations that potentially fall into the category of asymmetric threats. None of these actions has induced me to add to or alter my list of seventeen asymmetric threats. In the following paragraphs I briefly categorize some of the more notable recent actions according to the list of threats given in section 5.

The al Qaeda attacks on the World Trade Center and the Pentagon clearly fall into the category of asymmetric threats. They fit both #5, *suicide attacks*, and #6, *surprise first strikes*.

The al Qaeda attacks in Spain in March 2004 fall in asymmetric-threat category #8, *indiscriminate attacks on civilians and neutral countries*.

The June 2004 beheadings of Paul M. Johnson Jr. and Kim Sun-il by Islamic jihadists fall in asymmetric-threat category #7, *particularly brutal attacks*.

The 7 July 2005 London metro bombings fit both #5, *suicide attacks*, and #8, *indiscriminate attacks on civilians and neutral countries*.

In the March 2003 invasion of Iraq, it could be argued that Saddam Hussein pursued an asymmetric strategy of #13, *fighting not to win but to lose*, and #14, *intentionally exposing one's own population to high casualties*. A more plausible explanation, however, is that Saddam pursued a massive bluff strategy (stupid but symmetric), expecting the United States to, once more, back off and not invade Iraq.

The insurgents in Iraq have, over the past several years, pursued various asymmetric tactics. For example, attacks using vehicle-borne improvised explosive devices (VBIEDs) fall into asymmetric-threat categories #5, *suicide attacks*, and #8, *indiscriminate attacks on civilians and neutral countries*. One could also argue with some justification that the insurgents have pursued asymmetric strategies #14, *intentionally exposing one's own population to high casualties*, and #15, *actually attacking one's own population*. This argument is vitiated by the fact that the insurgents may regard much of the Iraqi population (e.g., those of different religious sects from their own) as not being part of their "own population."

Finally, I note that although insurgent VBIED attacks on civilians are asymmetric actions, IED attacks targeting American forces are not, for reasons that should be clear, based on the arguments in this technical report.

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